

Explosion, Graphite Fire Suspected

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By Boyce Rensberger

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collapsed roof and walls. Sen. Malcoim Wallop (R-Wyo.) said after an intelligence briefing late yesterday that the level of radiation from the plant was so high it was "possible even to cause instantaneous death."

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Anything that caused this water to stop flowing over the fuel rods could allow their natural heat to build to the melting point. If that happened, the heat could melt through the tube wall and ignite the aurrounding graphite.

Because the fuel rods contain a variety of radioactive elements, most being the products of the nuclear fission that generates the restor's normal heat, these elements tould then vaporize in the high heat. Because the Chernobyl plant lacked he kind of pressure-containment fome that is standard on most U.S. eactors, the radioactive substances were free to escape, especially ance the reactor building's roof vas either blown off or burned way.

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Some experts, however, suspect there was no meltdown. D. Allan Bromley. a nuclear physicist at Yale, said it was more likely that the explosion come from the graphite itself during a maintenance mishap. This is what happened in the Windscale accident.

The maintenance is necessary because, over time, radiation from the fuel alters the crystal structure of the graphite, causing it to bulge—a phenomenon known as the Wigner effect for its discoverer, Eugene V. Wigner. Technicians periodically remove the bulge by allowing the graphite to heat to higher-than-normal temperatures.

This realigns the crystal structure and causes the graphite to release additional heat of its own. Bromley said that if this procedurewere done improperly, the sudden release of heat could suddenly boil the water in the tubes, raising its pressure enough to cause an explosion, bursting the tubes and igniting the graphite. "I can't imagine anything that would cause a meltdown in this reactor," Bromley said. "There is no fuel meltdown. The temperatures are not high enough."

Bromley said that if a mishandled Wigner effect caused the Chernobyl accident, radioactive materials could escape as heat from the burning graphite eroded the surface of intact fuel rods.

Whatever the cause of the explosion, the fact that the graphite is burning—probably at around 4,000 degrees Fahrenheit—led the experts to think that the radiation release would probably continue for days.

Adelman said that because the plant is on the Pripyat River, which flows into a reservoir that supplies drinking water to the major city of Kiev, about 60 miles to the south, there was a major danger of water contamination.

Fallout settling on the Pripyat watershed could be washed into the river by subsequent rains, posing a long-term hazard.

Adelman said the fire was burning "at such a fantastic temperature" that it threatened to burn down to the water level. If this happens, high concentrations of radioactive material could wash from the site directly into the river.

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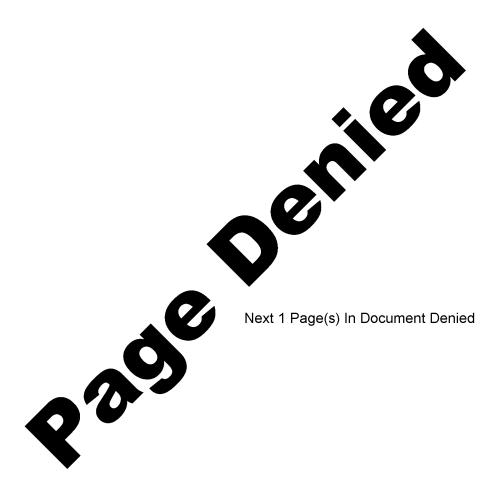
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Exhaustive studies of the TMI accident have estimated that the radiation released then was enough to cause one additional case of fatal

The impact of a nuclear accident on the food chain is also of critical concern. Waltop said radioactive iodine was falling on pasture land near the Soviet plant. Similar contamination has been reported as far away as Sweden. As dairy cows take up the iodine, they concentrate it in their milk, posing a health threat.

Amid the generally shared expressions of sympathy for the impact of the disaster on the Sovi people came one contrasting not "It's too bad," said Sen. Ste Symms (R-Idaho), "it didn't happeloser to the Kremlin."

Staff writers Philip J. Hills, Waller Pincus and Helen Dewar contributed to this report.



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